

REMARKS

Reconsideration is requested.

The indication that claims 2-5, 9, 13-16 and 18-20 contain allowable subject matter is acknowledged with appreciation. Claims 2 and 13 have been rewritten in independent form. Claims 9 and 18-20 have been rewritten as new independent claims 24 and 33-35. New claim 21 is similar to claim 6 but dependent on claim 2. New claim 22 is similar to claim 7 but dependent on claim 21. New claim 23 is dependent on claim 22. New claims 25 and 26 are similar to claim 10 but dependent from claim 2 and new claim 33, respectively. New claims 27 and 28 are similar to claim 11 but dependent from claims 25 and 26, respectively. New claims 29 and 30 are similar to claim 12 but dependent from claims 2 and 33, respectively. New claims 31 and 32 are similar to claim 17 but dependent from claims 2 and 33, respectively. Allowance of at least claims 2-5, 13-15 and 21-35 is requested.

Claims 1-8, 10-17 and 21-35 are pending. Claims 9 and 18-20 have been canceled and rewritten as new claims 33-35, as noted above.

The applicants will forward a further certified copy of the priority document under separate cover. The Examiner is requested to contact the undersigned, preferably by telephone, in the event the Examiner reaches the case for action and the certified copy has not been received by the Patent Office.

The specification has been revised to include a heading relating to the figures. Withdrawal of any objection to the disclosure is requested.

An Information Disclosure Statement is attached bringing to the Examiner's attention a reference cited recently in a copending related application. Return of an initialed copy of the attached PTO-1449 Form, pursuant to MPEP §609 is requested.

The Section 103 rejection of claims 1, 6, 7, 8, 10, 11, 12 and 17 over Jenny (U.S. Patent No. 3,407,897) in view of Charriere (FR 2,308,156A), is traversed. Reconsideration and withdrawal of the rejection are requested in view of the following distinguishing comments.

The applicants submit that Jenny does not describe a device having a closed hollow interior as required by the claims and, furthermore, Charriere fails to provide motivation for one to have modified the teachings of Jenny so as to arrive at the subject matter of the rejected claims.

The present invention of the rejected claims is concerned with an electro-acoustic device for creating patterns of particulate matter, wherein the device includes an electro-acoustic transducer that is located within the hollow **closed** interior of a housing. The present inventor has discovered that a closed interior provides improvements in the visualisation of the sound produced by the electro-acoustic transducer.

The rejected claims include a requirement that the hollow interior of the housing is **closed**. Specifically, claim 1 states that "... comprising a housing one end of which is closed and the other end of which is open, a diaphragm extending across the housing at or adjacent the open end of the housing to define and **close** a hollow interior to the housing ..." (emphasis added).

The ordinarily skilled person will appreciate that the rejected claims do not include arrangements such as the one taught by Jenny where the housing contains one or more apertures whereby exchange of air can occur from the interior of the housing to the exterior.

In particular, it is clear from page 12, lines 24 to 26 of the present application that where electric cables are to be introduced into the interior of the housing, this should be done in an air-tight manner so as not to lessen the advantages referred to above. Similarly, in other embodiments of the invention, ventilation tunnels 62 can be provided through parts of the device so as to allow cooling of a light source 54, without providing an opening in the housing that defines the hollow closed interior of the device (see page 22, lines 22 to page 23, line 3 and Fig. 3).

Furthermore, when discussing the embodiment of Fig. 2, it is clear to the ordinarily skilled person that the present application is concerned with minimising the escape of sound from the housing - "... acoustic feedback is **further** controlled by minimising escape of sound from the housing 2" (emphasis added) (see page 18, lines 14 to 20 and Fig. 2).

It will also be clear from the discussion of the "infinite baffle" arrangement at page 13, lines 1 to 9 that preventing the escape of sound from the housing is an aim of embodiments of the present invention.

Even the discussion of the size and shape of the housing at page 9, line 24 to page 10, line 4 makes clear that an uneven or disrupted internal surface of the housing would have a negative impact on the visualisation of the sound. The ordinarily skilled

person will appreciate that the provision of apertures such as taught by Jenny would not be desirable.

The ordinarily person will appreciate from reading the present application that the device of the present disclosure provides an electro-acoustic transducer in a **closed** hollow interior of a housing. Conveniently, closure of the housing is achieved by applying the diaphragm across the open end of the housing. The rejected claims include this requirement and will be understood by the ordinarily skilled person to not include devices containing apertures or openings in the housing.

The only disclosures in Jenny which may be relevant to a device that comprises an electro-acoustic transducer is understood to be at column 4, line 71 to column 5, line 37 and Fig. 4. This passage of Jenny makes it clear that the horn-shaped housing of the device has been adapted to contain a loud speaker and that the cable for the speaker is introduced into the device via the "blow pipe" of the horn. As is discussed in Jenny, the "blow pipe" part of the horn is provided so that a user can vocalise into the device for the purpose of exciting the diaphragm. Thus, the blow pipe aperture through which the cable is passed is of a considerably larger diameter than the cable itself (as can be seen from Fig. 4).

It follows therefore that the device of Fig. 4 (indeed, also the device of Fig. 1) does not include a housing "one end of which is closed and the other end of which is open, a diaphragm extending across the housing at or adjacent the open end of the housing to define and close a hollow interior to the housing" as required by claim 1.

In fact, the housing of the device of Fig. 4 of D1 does not have a closed end at all. It has only two open ends (the blow pipe end and the "pipe head" end).

Furthermore, the devices of both Fig. 4 and Fig. 1 of D1 include, in addition to the open ended blow pipe, an opening S in the container wall that is **required** to ensure pressure compensation and allows for escape of the air in the device (see column 3, lines 55 to 65 and Figs. 1 and 4).

Thus, for this additional reason, Jenny fails to disclose a device having a housing and a diaphragm extending across the housing so as to define and close a hollow interior to the housing.

Charriere also fails to disclose a device comprising a housing and a diaphragm wherein the diaphragm extends across the housing so as to define and **close** a hollow interior to the housing. In this connection, it is noted that the Examiner is understood to have asserted that Charriere discloses a "closed box", but this is not supported by the text of Charriere, which makes no such disclosure.

Jenny **requires** the presence of an aperture in the wall of the housing so as to achieve pressure compensation. This is explicitly recited in claim 1 of Jenny. It is also shown in both of the embodiments. Furthermore, the housing of Jenny is in the form of a horn, one end of which comprises a blow pipe specifically shaped so as to enable a user to vocalise into the housing.

The housing therefore comprises **two** openings that allow air and hence sound to move between the interior of the housing and the exterior.

In the case of the embodiment comprising a loud speaker, one of these apertures is conveniently used to enable a cable to be passed into the housing end connected to the loud speaker.

Taken as a whole, the teachings of Jenny are clear. The applicants believe Jenny required air flow and hence sound conduction between the interior of the housing and the exterior. This is the case regardless of whether sound is introduced by a user or via a loud speaker. No other arrangement is contemplated by Jenny.

Charriere provides no additional teaching over and above that of Jenny that would prompt the ordinarily skilled person to modify the device of Jenny so as to close the aperture and blow pipe of Jenny. Charriere's contribution is merely, at best, to suggest that the loud speaker 6 should be fixed directly to a structure 7 adjacent the particulate-containing window 10 (see Figure). This arrangement would appear to be difficult, perhaps impossible, to achieve in the arrangement of Fig. 4 of Jenny because of the curved sides of the housing. For this reason alone, a combination of Jenny and Charriere would appear to be impossible for the ordinarily skilled person to achieve.

In any case, Charriere is primarily concerned with teaching the ordinarily skilled person one way in which the particulates in the window are illuminated for observation outside the device. This does not in any way constitute a teaching or suggestion that would cause the ordinarily skilled person to arrive at the subject matter of the rejected claims.

In an effort to expedite prosecution, the applicants note that the attached Mitsubishi reference is in a different technical field. It is concerned with electronic

oscillator circuits comprising a piezo electric crystal. These circuits are designed to provide an electrical signal having a very precise frequency. Typically, the frequency is in the MHz range. They are generally very small devices.

The ordinarily skilled person would not have considered Mitsubishi to be relevant to the problem of accurately displaying Chladni patterns over a range of **audible** frequencies (20Hz to 20kHz) and in particular to enable visualisation of sounds produced **externally** to the device (e.g. with a microphone). Furthermore, Mitsubishi contains **no** teaching that would have motivated the ordinarily skilled person to have modified the open-ended horn of Jenny so as to provide a device with a closed interior.

The invention of the rejected claims provides a device with an electro-acoustic transducer located within the hollow interior of the housing, the hollow interior being defined and closed by a diaphragm extending across the housing.

The provision of a "closed" hollow interior represents the opposite teaching to that disclosed in Jenny. Furthermore, Charriere provides no relevant teaching in this regard. Finally, Mitsubishi would not have been consulted by the ordinarily skilled person.

Thus, in defining a device that closes the interior of the housing from the exterior of the device, the rejected claims define patentably over the cited combination of art.

Withdrawal of the Section 103 rejection is requested.

The claims are submitted to be in condition for allowance and a Notice to that effect is requested. The Examiner is requested to contact the undersigned, preferably by telephone, in the event anything further is required in this regard.

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AMENDMENT

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____
B. J. Sadoff
Reg. No. 36,663

BJS:
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100